



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/912,373	07/26/2001	Jia Hao Li	MR2349-358/DIV1	8219
4586	7590	09/17/2004	EXAMINER	
ROSENBERG, KLEIN & LEE 3458 ELLICOTT CENTER DRIVE-SUITE 101 ELLICOTT CITY, MD 21043			CIRIC, LJILJANA V	
			ART UNIT	PAPER NUMBER

3753

DATE MAILED: 09/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/912,373

Applicant(s)

LI, JIA HAO

Examiner

Ljiljana (Lil) V. Ciric *JVC*

Art Unit

3753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 August 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,8 and 33-43 is/are pending in the application.
- 4a) Of the above claim(s) 38,39 and 41-43 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,8,33-37 and 40 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 July 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. This Office action is in response to the reply filed on August 30, 2002.
2. Claims 1, 8, and 33 through 43 remain in the application. Of these, claims 38, 39, and 41 through 43 remain withdrawn from further consideration, whereas claim 1 and claims 8, 33 through 37, and 40 are as amended, either directly or indirectly.

Response to Arguments

3. Applicant's arguments filed on August 30, 2002 have been fully considered but they are not persuasive.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., that the bubble generator of the instant invention continuously generates a plurality of bubbles which are guided within the guide region to flow through the loop; that the expanded vapor which forms bubbles in the instant invention is collected in the expanding area) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Furthermore, applicant is hereby respectfully reminded that claims in a pending application should be given their broadest reasonable interpretation. *In re Pearson*, 181 USPQ 641 (CCPA 1974).

Furthermore the examiner, upon reconsideration, withdraws the conclusion that the claim language relating to the closed loop defining a looped contour having bends along both vertical and horizontal planes overcomes the previously outstanding prior art rejections. The added limitation corresponding to the above claim language now in claim 1 fails to obviate the applicability of the previously applied Okayasu ('790) reference, at least as broadly interpreted as required, because (a) first of all, a three-dimensional pipe with three-dimensional bends as shown in the figures of the Okayasu

Art Unit: 3753

('790) reference inherently includes "bends along both vertical and horizontal planes" as now recited in the claims, at least as broadly interpreted as required; and, (b) second of all, the Okayasu ('790) reference furthermore discloses that the pipe of the closed loop may be made of a flexible material as noted in greater detail in the corresponding prior art rejection as outlined below, and which, once again, will inherently exhibit bends in three dimensions and in all planes.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Applicant's arguments thus fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references.

Applicant's arguments thus do not comply with 37 CFR 1.111(c) because they do not clearly point out the patentable novelty which he or she thinks the claims present in view of the state of the art disclosed by the references cited or the objections made. Further, they do not show how the amendments avoid such references or objections.

Election/Restrictions

4. Claims 38, 39, and 41 through 43 remain withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to nonelected inventions or species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on April 19, 2002.

Drawings

5. The drawings filed on July 26, 2001 are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the expanded area as recited in the

Art Unit: 3753

claims (i.e., in claim 1) must be shown or the feature canceled from the claims. No new matter should be entered.

Corrected drawing sheets are **required** in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. *The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures.* If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance. [Note: The proposed drawing corrections received on August 30, 2002 are hereby approved and are to be incorporated in the required formally corrected drawing sheets to be provided in reply to this Office action.]

Specification

6. The abstract of the disclosure is objected to because it is written in a run-on fashion, contains numerous idiomatic informalities (i.e., "bubbles is easily separable and a radiator"), fails to concisely and clearly summarize the invention, and does not avoid using phrases which can be implied (i.e., "is disclosed"). Correction is required. See MPEP § 608.01(b).

7. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: the specification fails to provide any antecedent basis for "a looped contour" as now recited in claim 1.

Art Unit: 3753

8. The disclosure is objected to because of the following informalities, for example: the first sentence on page 1 of the specification appears to have a word or words missing therefrom; "seal vacuum chamber" [page 1, line 10] should be replaced with "sealed vacuum chamber"; "The heating way is to heat one end of the pipe" [page 1, lines 13-14] is not idiomatically or grammatically proper as written; "After the gas is condensed to become liquid at the cold section" [page 1, lines 15-16] is not a complete sentence; "will be deteriorated with the increment of an operation inclination" [page 1, lines 19-20] is not idiomatically or grammatically proper as written; "a" should be inserted immediately preceding "gas phase" [page 1, line 23]; "so that heat supper conduction in the heat pipe fail" [page 1, lines 24-25] is not idiomatically and grammatically proper as written and is generally incomprehensible; "since an operation inclination exist" [page 2, line 3] is not idiomatically and grammatically proper as written; "Accordingly, it is apparent that heat pipe has some original disadvantages necessary to be improved" [page 2, liens 4-5] is not idiomatically and grammatically proper as written. Appropriate correction is required.

9. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

10. 35 U.S.C. 112, first paragraph, requires the specification to be written in "full, clear, concise, and exact terms." The specification is replete with terms which are not clear, concise and exact. The specification should be revised carefully in order to comply with 35 U.S.C. 112, first paragraph. An example of an unclear, inexact or verbose term used in the specification is: "heat absorbing source" [page 8, line 5 and other occurrences]. This term is inexact and unclear because one skilled in the art cannot determine with certainty whether this term is intended to refer to a heat source such as an electronic heat generating element OR to a heat absorbing element such as a heat sink OR to a heat retaining element such as a heat accumulator.

Art Unit: 3753

11. A substitute specification in proper idiomatic English and in compliance with 37 CFR 1.52(a) and (b) is required. The substitute specification filed must be accompanied by a statement that it contains no new matter.

Claim Rejections - 35 USC § 112

12. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

13. Claims 1, 8, 33 through 37, and 40 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claims as amended now contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor, at the time the application was filed, had possession of the claimed invention. Claim 1 as amended recites a closed fluid loop in contact with a heat absorbing source *disposed in a computer*, yet the originally filed disclosure fails to show or describe a heat absorbing source 1 as being disposed IN a computer or machine 10. Instead, the various embodiments of the invention are disclosed as having a heat absorbing source 1 disposed ON a computer or machine 10. Thus, reciting the heat absorbing source as being disposed IN a computer represents new matter not supported by the originally filed disclosure.

14. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

15. Claims 1, 8, 33 through 37, and 40 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Upon reconsideration with regard to the claims, it is not clear whether the limitation "heat absorbing source" [claim 1, line 2, and other occurrences] is intended to refer to a heat source [i.e. an

Art Unit: 3753

electronic heat source such as the computer] OR to a heat retaining element such as a heat accumulator OR to a heat absorbing element [i.e., a heat sink]. Note that the drawings show the heat absorbing source 1 as being a plate and thus appear to support the last-mentioned interpretation of the term, but the term nevertheless is inherently self-contradictory and thus unclear, and furthermore the specification fails to clearly define the term so as to obviate the indefiniteness of the term.

Also, The term "easily" in claim 1 is a relative term which renders the claim indefinite. The term "easily" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Thus, as used to qualify the manner in which the bubbles are separable from the guide region, this term renders the same indeterminate and the claim indefinite.

Also with regard to claim 1 as amended, it is not clear whether the limitation "a closed fluid loop in contact with a heat absorbing source *disposed in a computer*" is intended to mean that the closed fluid loop is disposed in a computer OR that the heat absorbing source is disposed in a computer OR that both the closed fluid loop and the heat absorbing source are disposed in a computer, thus rendering indefinite the metes and bounds of protection sought by the claim and all claims depending therefrom.

Also with regard to claim 1 as amended, it is not clear whether the term "therefrom" refers to the loop or to the guide region or to the bubble generator or to some other previously recited element in the claim, thus rendering indefinite the metes and bounds of protection sought by claim 1 and all claims depending therefrom. Recommend replacing the term "therefrom" with a direct recitation of the element intended to be recited thereby.

With regard to each of claims 36 and 37, it is not particularly clear what is meant by the limitations "at least one fin *passes through* the loop" since these limitations contain idiomatic informalities.

Art Unit: 3753

With regard to claim 40 as written, it is not clear whether or not the limitation "a computer" in line 2 of the claim refers back to the same computer recited in line 2 of claim 33 from which claim 40 depends. If it does, recommend replacing the limitation "a computer" [claim 40, line 2] with the limitation "said computer" or "the computer", as appropriate. If it does not, then recommend replacing the limitation "a computer" [claim 40, line 2] with the limitation "another computer" or similar, as appropriate.

Claim Rejections - 35 USC § 102

16. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

17. As best can be understood in view of the indefiniteness of the claims, claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Okayasu ('570, previously of record).

Okayasu ('570) discloses a bubble cycling heat exchanger essentially as claimed, including, for example: a closed fluid loop as shown in each of Figures 1 and 4, the closed fluid loop being in contact with a "heat absorbing source" such as electronic devices 32 disposed on substrates 33 "in a computer" as broadly interpreted as required, the loop (including cyclic flow passage 36) contacting "the heat absorbing source" 32, 33 through a heat conducting block or heat conductive heat accumulating portion 31 in the electronic equipment/computer [see column 4, lines 22-32]; the loop having a bubble generator or heat drive pump 24 or 4 for generating bubbles, the loop having an expanded area such as recessed portion 3 for generating bubbles; the loop being formed with a guide region such as discharge stopper valve 5 from which the bubbles are easily separable and a radiator 9, 14, 27, or 30; the heat conducting block or heat accumulating portion 31 being connected to the "heat absorbing source" 32 and 33; and, the closed loop being defined as a looped contour having bends along both vertical and horizontal planes (i.e., in three dimensions).

Art Unit: 3753

The reference thus reads on the claim.

Claim Rejections - 35 USC § 103

18. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

19. Alternately for claim 1 and as best can be understood in view of the indefiniteness of the claims, claims 1, 33, 37, and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okayasu ('790, previously of record) in view of Larson et al. (previously of record).

Okayasu ('790) discloses all of the claimed features of the invention except for the loop cooling an electronic device within a computer or being in contact with a "heat absorbing source *disposed in a computer*". Okayasu ('790), for example, discloses a closed fluid loop including pipes M1 and M2, the loop contacting a heat absorbing source or "suitable heat source" [see column 3, lines 1-2] through a heat conducting block B, the loop also having a bubble generator including an expanded area or cavity R and a recess P as well as a check valve CV2 allowing bubble formation and "easy" bubble separation, and, last but not least, radiator EX including fins. Okayasu ('790) discloses that pipes M1 and M2 may be made of a flexible plastic such as vinyl chloride which inherently can bend along various directions, including both horizontal and vertical planes.

While Okayasu ('790) does disclose the bubble heat exchanger (i.e., a looped heat pipe) as being in contact with a "suitable heat source" (a.k.a., "a heat absorbing source") and does disclose the bubble heat exchanger/looped heat pipe as being suitable for portable applications, it does not disclose this heat source as necessarily being an electronic device within a computer. Nevertheless, it is known in the art and taught by Larson et al. to heat a looped heat pipe in order to cool a particular electronic device within a personal computer in a compact manner. Thus, it would have been obvious to one skilled in the art at

Art Unit: 3753

the time of invention to modify the bubble heat exchanger/looped heat pipe of Okayasu ('790) by having the heat source or the "heat absorbing source" be an electronic element needing cooling within a personal computer as taught by Larson et al. in order to effect compact cooling of the electronic device within even a portable personal computer such as a laptop computer without compromising the portability of the computer.

20. As best can be understood in view of the indefiniteness of the claims, claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okayasu ('790, previously of record) in view of Larson et al. (previously of record) as applied to claims 1, 33, 37, and 40 above, and further in view of Pai (also of record).

As discussed in greater detail above, Okayasu ('790) as modified by Larson et al. discloses and/or teaches all of the claimed features of the instant invention with the exception of a spiral wire being the bubble generator as recited in claim 8. Nevertheless, it is known in the art and taught by Pai to have a spiral wire act as both a bubble generator and a wick for the working fluid in a heat pipe. Thus, it would have been obvious to one skilled in the art at the time of invention to employ a spiral wire in the bubble heat exchanger/heat pipe of Okayasu as modified by Larson et al. in order to enhance wicking and boiling of the working fluid within the heat pipe loop as taught by Pai.

21. As best can be understood in view of the indefiniteness of the claims, claims 34 through 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okayasu ('790, previously of record) in view of Larson et al. (previously of record) as applied to claims 1, 33, 37, and 40 above, and further in view of Mohi et al. (previously of record).

As discussed in greater detail above, Okayasu ('790) as modified by Larson et al. discloses and/or teaches all of the claimed features of the instant invention with the exception of a wind/air outlet and a blower installed in a side wall of a computer or personal computer. Nevertheless, it is known in the art and taught by Mohi et al. to have a wind/air outlet and a blower installed in a side wall of a computer for

Art Unit: 3753

the purpose of enhancing the removal of heat to the exterior of a personal computer's housing. Thus, it would have been obvious to one skilled in the art at the time of invention to add a wind/air outlet and a blower in a side wall of the housing of a computer cooled by the bubble heat exchanger/heat pipe of Okayasu as modified by Larson et al. in order to enhance heat removal from the inside to the outside of the computer housing as taught by Mohi et al.

Conclusion

22. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ljiljana (Lil) V. Ciric, whose telephone number is (703) 308-3925. While she works a flexible schedule that varies from day to day and from week to week, Examiner Ciric may generally be reached at the Office during the work week between the hours of 10 a.m. and 6 p.m. ET.

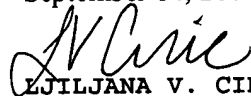
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Scherbel, can be reached on (703) 308-1272.

The NEW central official fax phone number is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0861.

lvc

September 14, 2004


LJILJANA V. CIRIC
PRIMARY EXAMINER
ART UNIT 3753